

Total Body Irradiation (TBI) is being used with increasing frequency as a component of the preparatory regimen for bone marrow transplantation of patients with refractory malignancies including leukemia, non-Hodgkin's lymphoma, and neuroblastoma. Meanwhile, this offers a difficult dosimetric challenge due to the complexity of the irradiated volume and the enlarged fields (exceeding the body size in all direction). We investigate the possibility of employing the Monte Carlo simulation to calculate the dosimetry of TBI.

First, we simulate the standard condition of the Co-60 teletherapy machine using the EGS4 codes. We expect to see the coincidence of the percent depth dose and fields factors between the simulation values and the measured values by ion chambers.

And then, at the extended SSD (335cm) condition, we put the TLDs on the critical organs of the Rando Phantom. Also, we need to point out the positions of these critical organs to calculate the relative dosage.

Comparing the TLD readings and the simulated values, we find out that the differences can reach 10% (TLD readings are higher). And the dosages of the interested points which we can't measure in conventional ways are also performed. These data would help us understanding the dosage distribution of the TBI dosimetry.